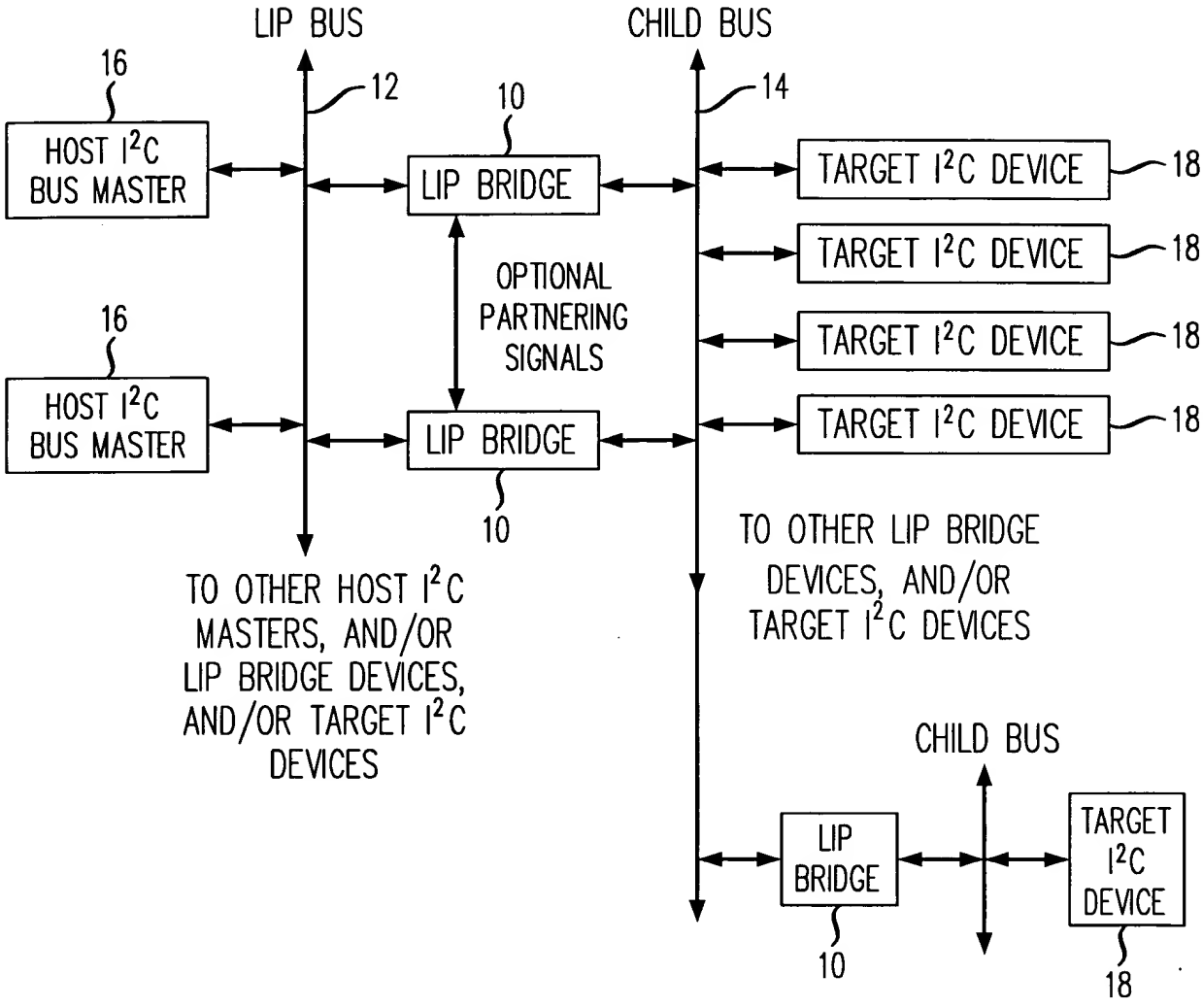
Drawing Approved CEC 12/3/03

FIG. 1
TYPICAL LIP BRIDGE USAGE



"Replacement Sheet"

FIG. 2

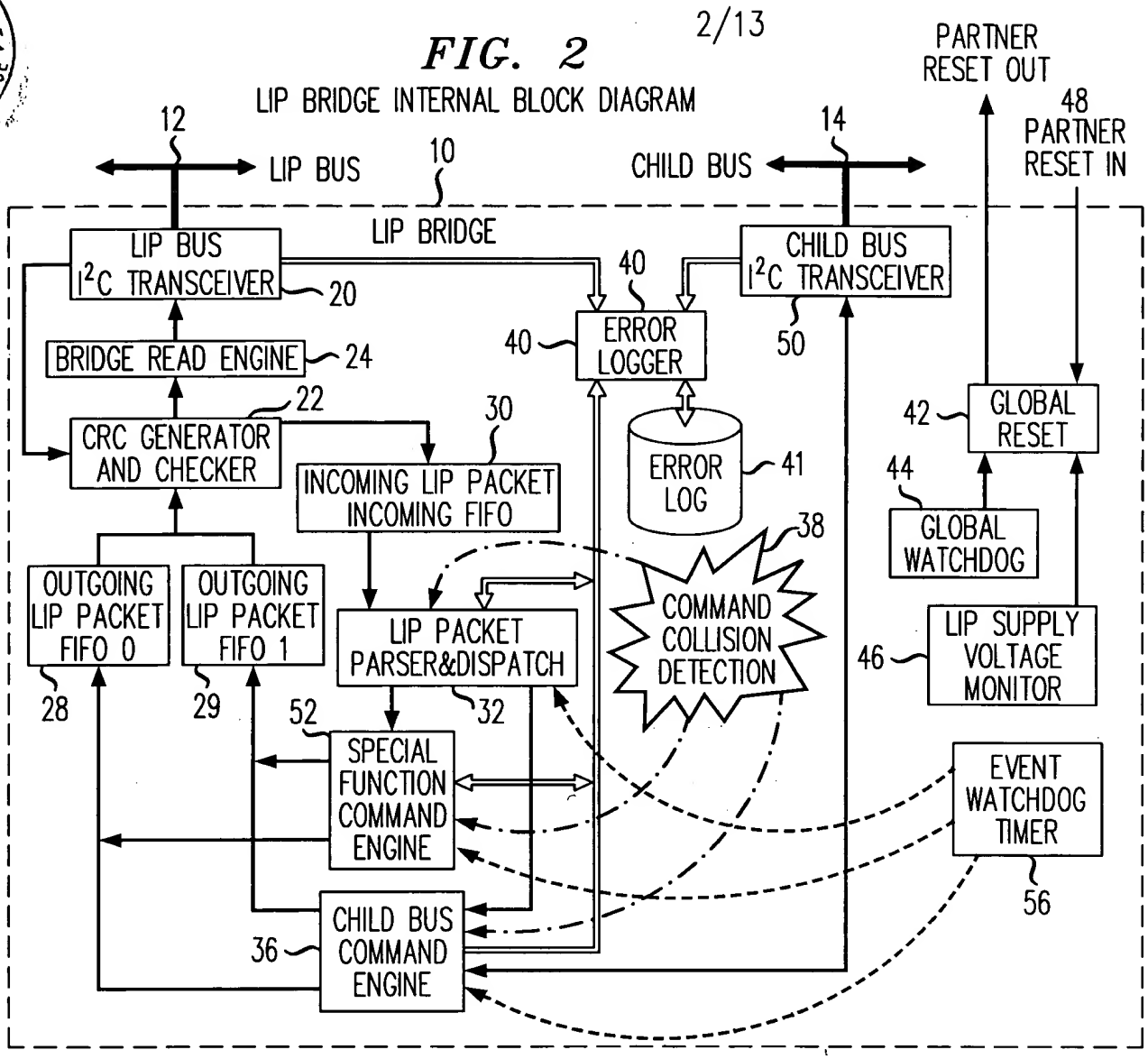
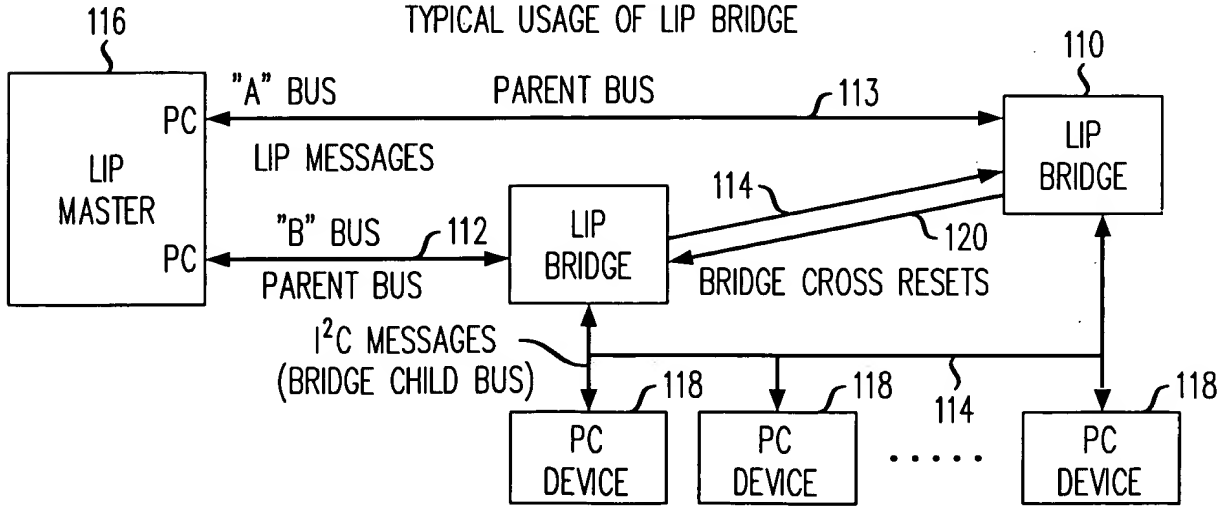


FIG. 3



"Replacement Sheet"

FIG. 4

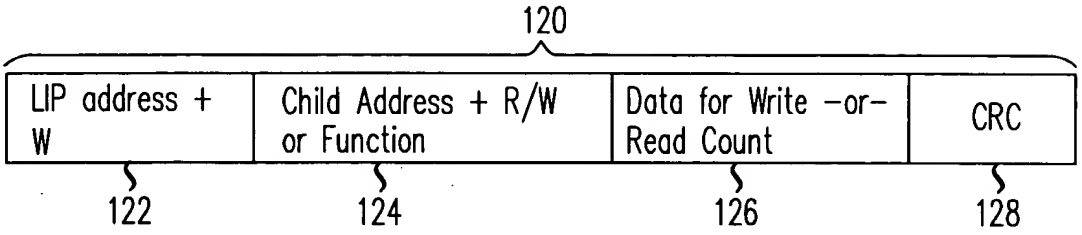


FIG. 5

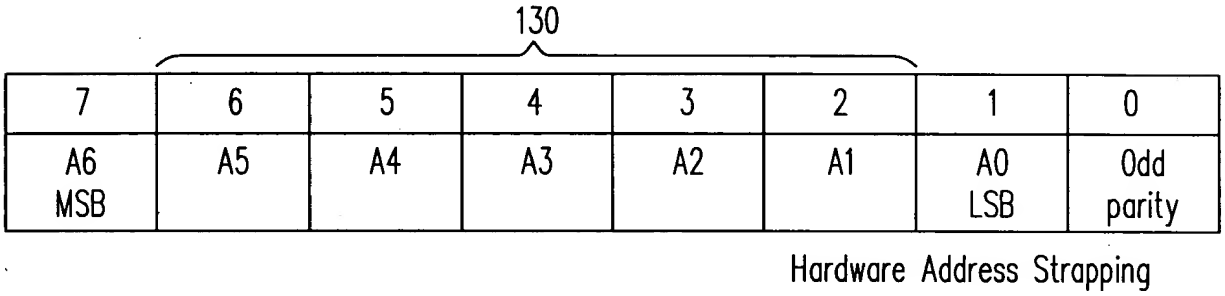


FIG. 6

The LIP Address / Function encoding within the four byte LIP packet is as follows:

Lip address

7	6	5	4	3	2	1	0
A6 MSB	A5	A4	A3	A2	A1	A0 LSB	R/!W

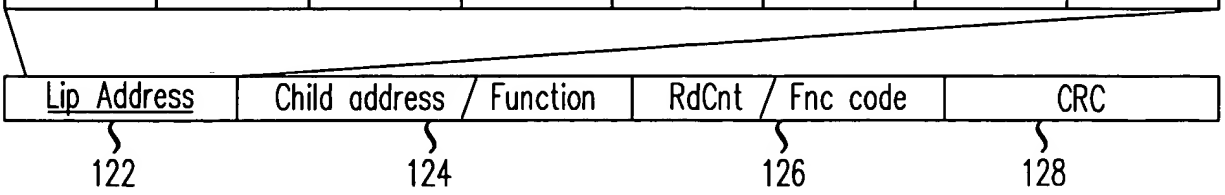


FIG. 7

The Child Address / Function Encoding is as follows:

Child Address / Function

7	6	5	4	3	2	1	0
MSB	...					LSB	R/!W

LIP Address	Child address / Function	Wr data / RdCnt / Fnc code	CRC
122	124	126	128

FIG. 8

Read Count Field

7 MSB	6	5	4	3	2	1	0 LSB
Rsvd-0	SrcId	RdCnt					

LIP Address	Child Bus Address	Read Count field	CRC
122	124	126	128

FIG. 9

Read Data Tag

7 MSB	6	5	4	3	2	1	0 LSB
No Data	SrcId	RdCnt					

138 136 134

LIP Address + R	Read Data Tag	RdCnt data bytes	CRC
	132	130	142

FIG. 10

Status Byte Register Organization

RAZ	RAZ	RAZ	ME	LBWE	LBRE	CBWE	CBRE
MSB							LSB

150

TABLE 8

Key to Symbols	
Symbol	Meaning
S	I²C bus start condition
P	I²C bus stop condition
A	Acknowledge
A	No-Acknowledge
LA	LIP address
CA	Child bus address
W	R/!W bit within address field is set for WRITE
R	R/!W bit within address field is set for READ
CRC	CRC byte
Data	Data byte
Count	Read count
Fnc(x)	Special function command "x" – where x is the function's hex code
	Gray shade indicates data sent from Host Bus to LIP bridge
	White indicates data sent from LIP bridge to Master
.....	Zero or more instances of the preceding transaction.

FIG. 11

Host bus master to LIP One Byte Child Bus Write

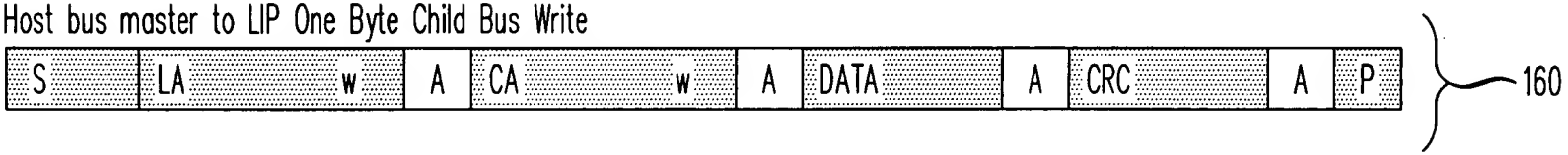


FIG. 12

Host bus master to LIP Multi-Byte Write

S	LA	w	A	b'1111.111n'	A	SpcFnc*	A	CRC	A	P

* Child I²C start

S	LA	w	A	CA	w	A	DATA	A	CRC	A	P

.....

S	LA	w	A	CA	w	A	DATA	A	CRC	A	P

To complete transaction, either:

S	LA	w	A	b'1111.111n'	A	SpcFnc*	A	CRC	A	P

*

OR

Child I²C stop

S	LA	w	A	* * *	A	*	A	CRC	A	P

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Where: n=0 for host bus master 0 and n=1 for host bus master 1. The "***" CA field contains a different value than that contained in the first data packet (SECOND PACKET ABOVE). This can be either a different child address, or it can be a special function indicator of binary '1111.111n'.

FIG. 13

Special Function Action Returning Nor Requiring Data

S	LA w	A	b'1111.111n'	A	Fnc(x)	A	CRC	A	P

164

Where n=0 for host bus master0, n=1 for host bus master 1 & "x" is the desired hex command code.

FIG. 14

Special Function Action Returning Data

S	LA w	A	b'1111.111n'	A	Fnc(x)	A	CRC	A	P

166

Where n=0 for host bus master0, n=1 for host bus master 1 &"x" is the desired hex command code.

S	LA r	A	Read data tag	A	Data	A	....	Data	A	CRC	a	P

FIG. 15

Special Function Action Requiring Data

S	LA w	A	OxFE	A	Data	A	CRC	A	P

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FIG. 16

Host bus master Child Bus Read Via LIP Bridge Action

S	LA w	A	CA r	A	Read Count	A	CRC	A	P

S	LA r	A	Read data tag	A	Data	A	....	Data	A	CRC	a	P

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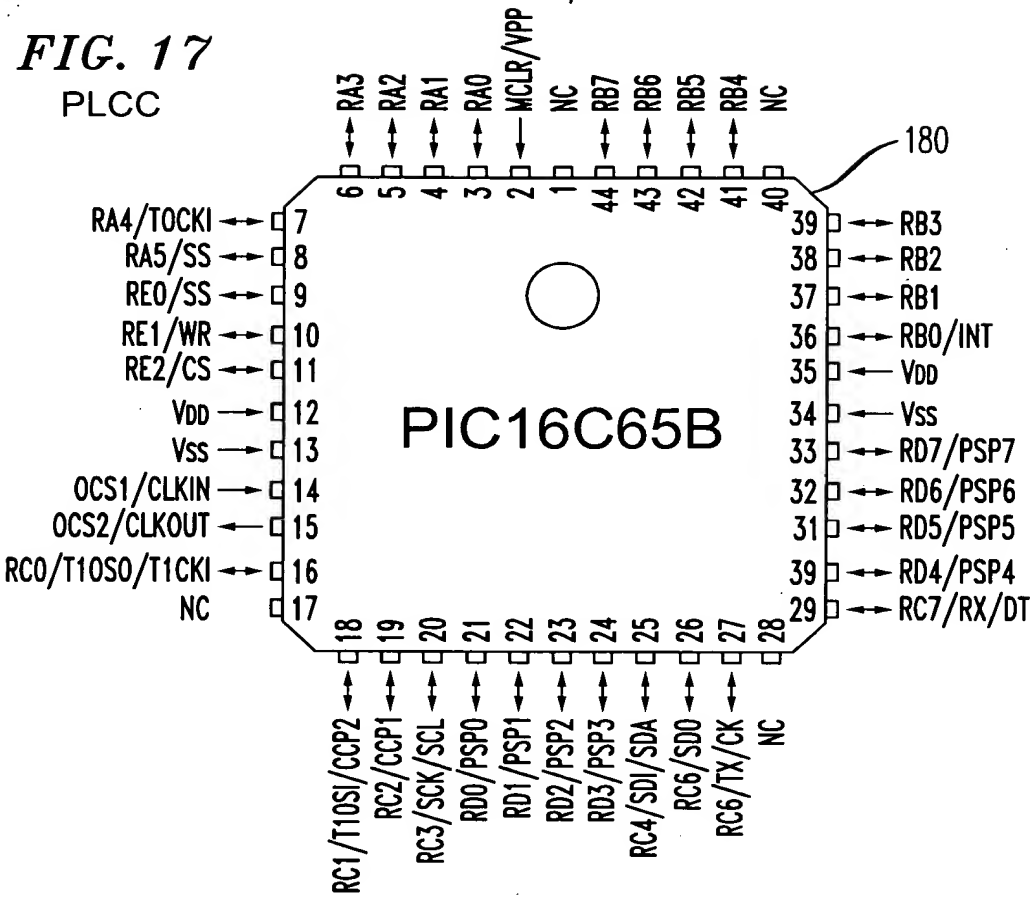
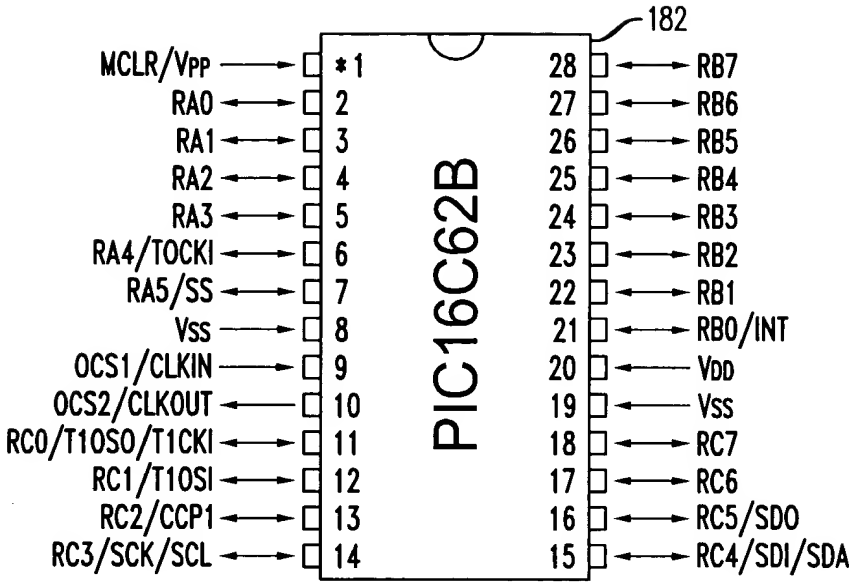
FIG. 17

PLCC



PIN #	Label	Function
2	!MCLR	!partner_reset_in – Active low input for reset from partner LIP bridge (Also VPP pin for in circuit programming)
3	RA0	!partner_reset_out – Active low output to reset partner LIP bridge
20	RC3	LIP_clk – LIP bus serial clock in
25	RC4	LIP_data – LIP bus serial data in/out (bidirectional)
27	RC6	child_clk – child bus clock output
29	RC7	child_data – child bus data in/out (bidirectional)
37	RB1	LIP_addr_parity – parity bit for LIP address (strap to make odd parity)
38	RB2	LIP_addr0 – bit 0 to strap LIP I^2C address
39	RB3	LIP_addr1 – bit 1 to strap LIP I^2C address
41	RB4	LIP_addr2 – bit 2 to strap LIP I^2C address
42	RB5	LIP_addr3 – bit 3 to strap LIP I^2C address
4	RA1	LIP_addr4 – bit 4 to strap LIP I^2C address
5	RA2	LIP_addr5 – bit 5 to strap LIP I^2C address
43	RB6	In circuit programming clock
44	RB7	In circuit programming data
6	RA3	child_bus_busy_out – active low open collector output when this LIP bridge owns child bus (needs a 1K pull up to Vdd).
36	RB0	child_bus_busy_in – active low input when partner LIP bridge owns child bus

FIG. 18



PIN #	Label	Function
1	!MCLR	!partner_reset_in – Active low input for reset from partner LIP bridge (Also VPP pin for in circuit programming)
2	RA0	!partner_reset_out – Active low output to reset partner LIP bridge
14	RC3	LIP_clk – LIP bus serial clock in
15	RC4	LIP_data – LIP bus serial data in/out (bidirectional)
17	RC6	child_clk – child bus clock output
18	RC7	child_data – child bus data in/out (bidirectional)
22	RB1	LIP_addr_parity – parity bit for LIP address (strap to make odd parity)
23	RB2	LIP_addr0 – bit 0 to strap LIP I^2C address
24	RB3	LIP_addr1 – bit 1 to strap LIP I^2C address
25	RB4	LIP_addr2 – bit 2 to strap LIP I^2C address
26	RB5	LIP_addr3 – bit 3 to strap LIP I^2C address
3	RA1	LIP_addr4 – bit 4 to strap LIP I^2C address
4	RA2	LIP_addr5 – bit 5 to strap LIP I^2C address
27	RB6	In circuit programming clock
28	RB7	In circuit programming data
5	RA3	child_bus_busy_out – active low output when this LIP bridge owns child bus (needs a 1K pull up to Vdd).
21	RB0	child_bus_busy_in – active low input when partner LIP bridge owns child bus

FIG. 19

Level 1 Data Flow Diagram

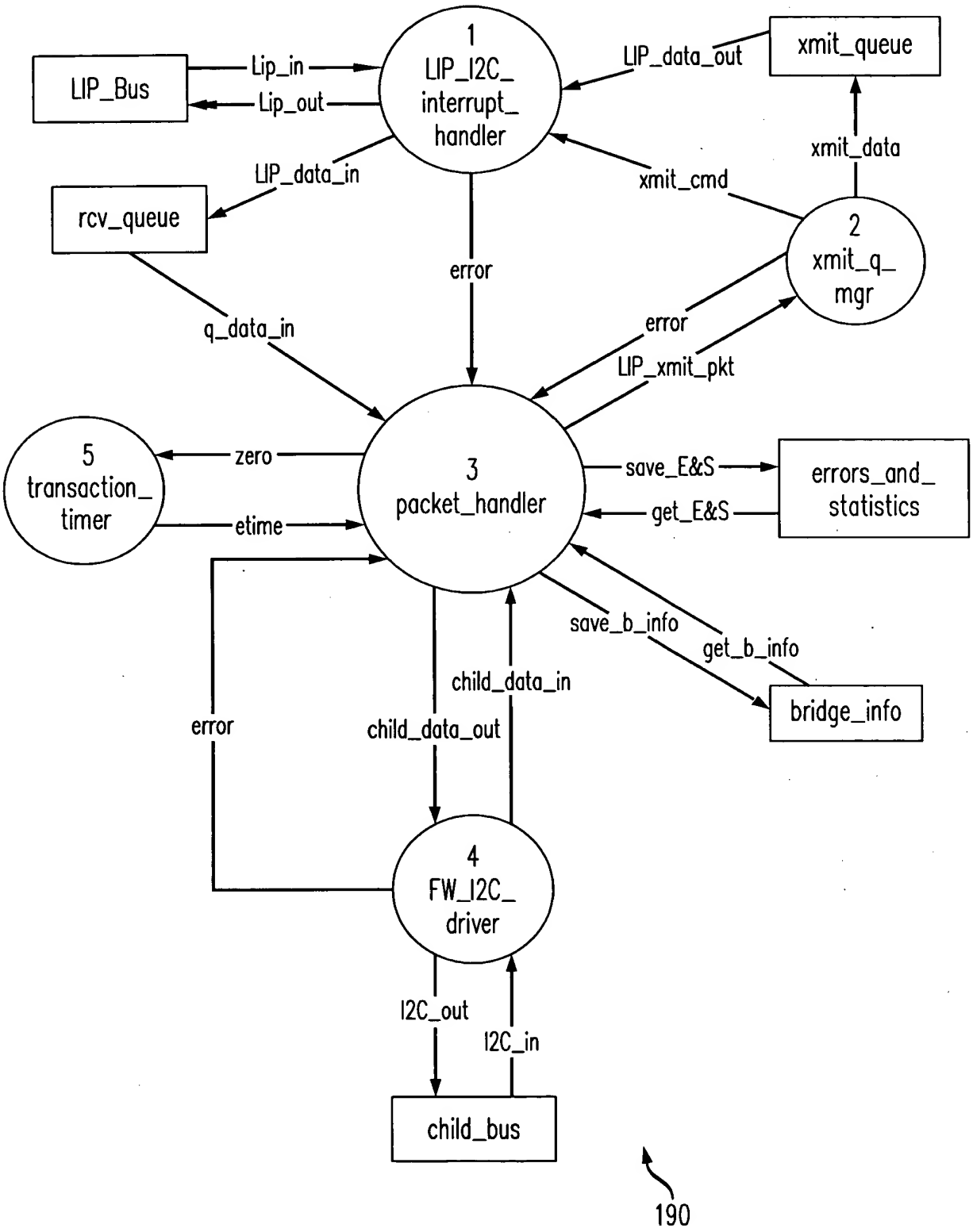


FIG. 20

Packet Parser Data Flows

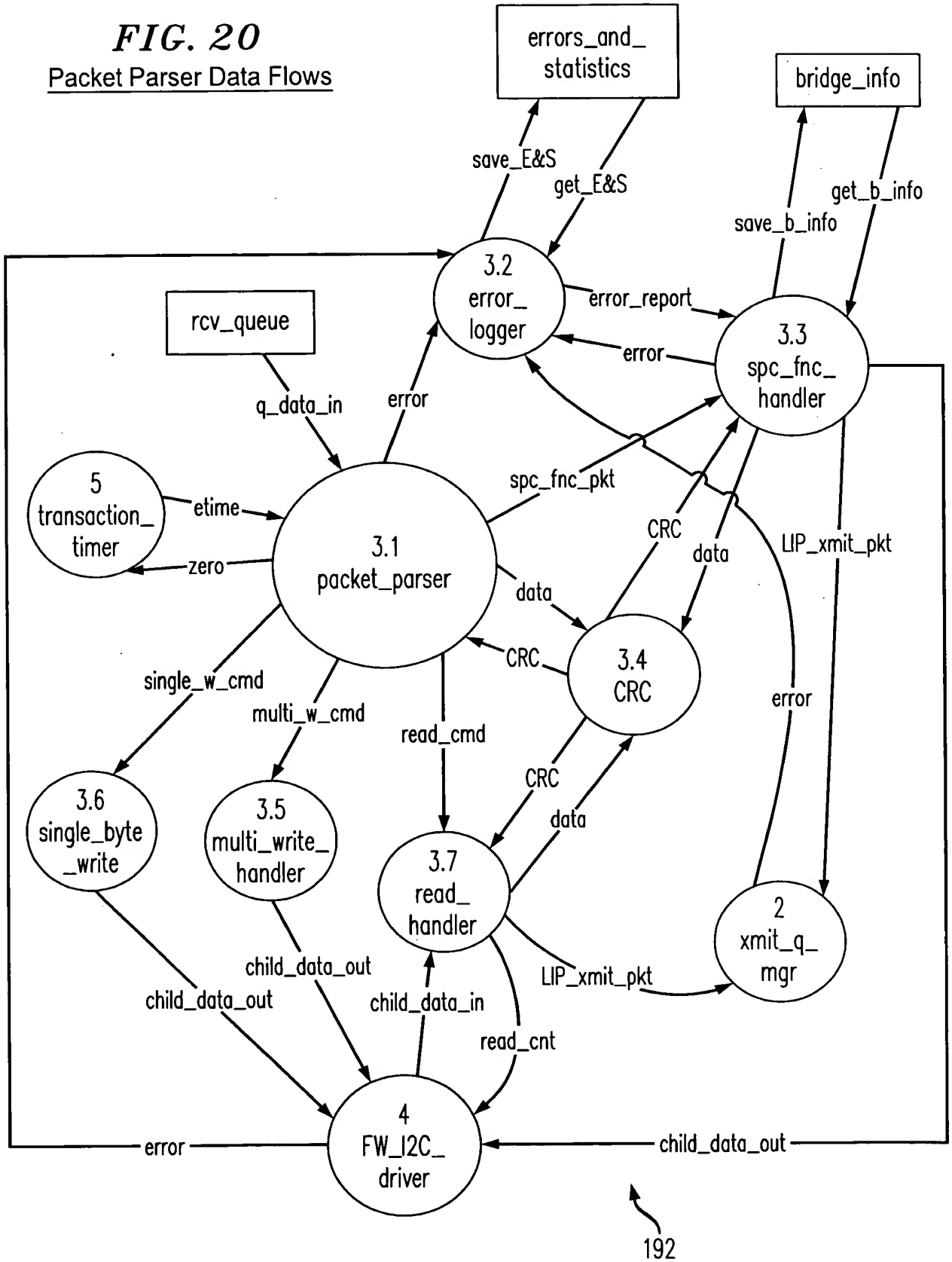


FIG. 21

Firmware I2C Data Flows

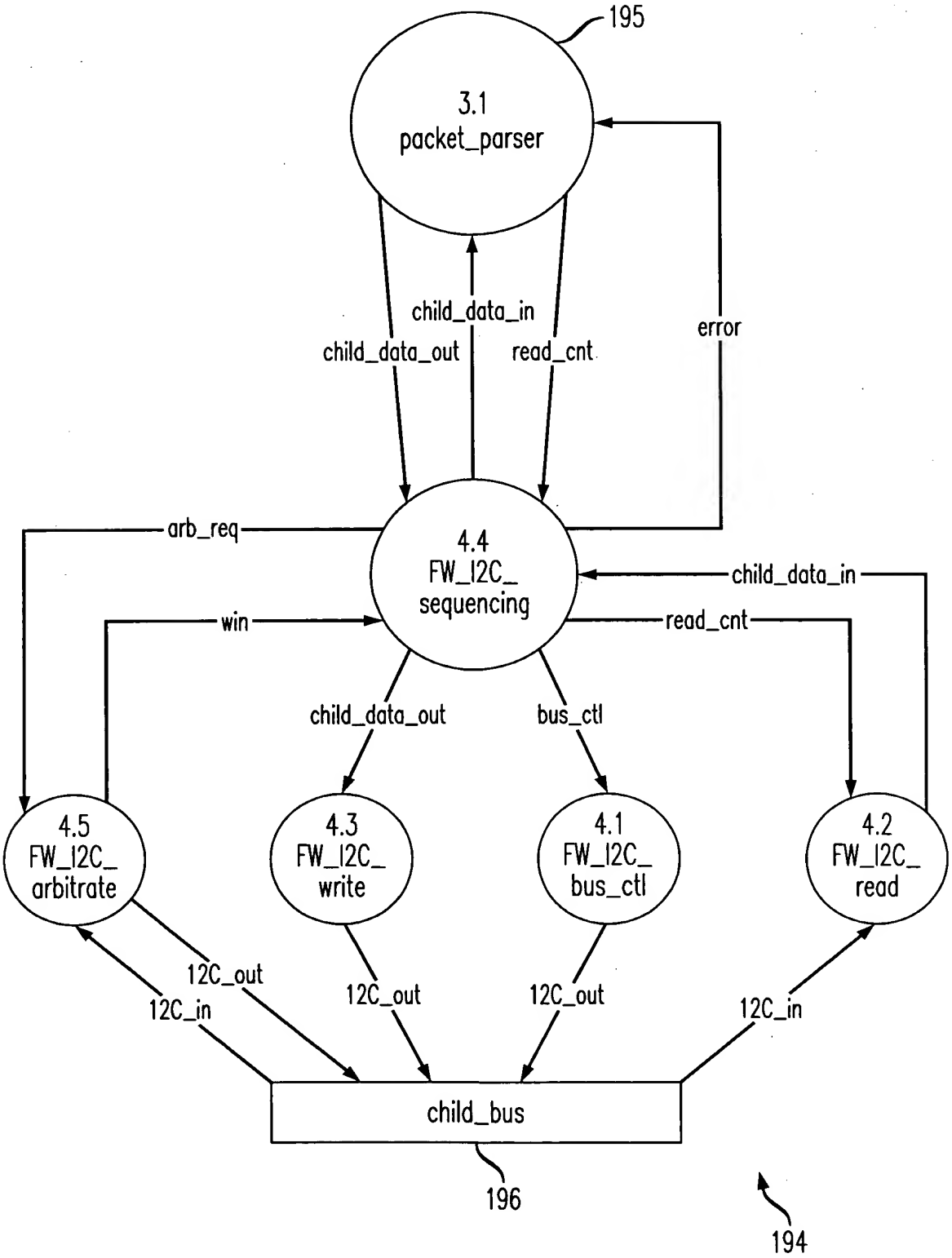


FIG. 22